

AMENDMENTS TO THE CLAIMS:

Please cancel claims 31, 32, and 34 without prejudice or disclaimer, amend claims 1, 2, 11, 15-20, 22, 24, 29, and 30, and add new claims 35-39 as provided below:

1. (currently amended) A method of changing a physical property of a structure, comprising:

providing energy of a first energy type to a structure by performing a first energy process according to an operational setting, at least one of the operational setting and a time value being selected according to a first order rate relationship for the first energy process, according to a first order rate relationship for a second energy process, and according to a desired physical property value; and

providing energy of a second energy type to the structure at an energy level above an activation energy for the structure by performing the second energy process;

wherein the first and second energy processes are performed concurrently for at least the time value;

wherein the first order rate relationship for the first energy process relates application of the first energy type to the structure and a physical property of the structure; and

wherein the first order rate relationship for the second energy process relates application of the second energy type to the structure and the physical property;

wherein the first and second energies are different; and

wherein the total energy provided to the structure by the first and second energy processes is above an activation energy for the material of the structure.

2. (currently amended) The method of claim 1, wherein the first energy type is thermal and wherein the second energy type is oscillatory.

3. (original) The method of claim 2, wherein the operational setting is a temperature setting, wherein one of the temperature setting and the time value is selected according to the first order rate relationship for the first energy process, according to the first order rate relationship for the second energy process, according to the desired physical property value, and according to the other one of the temperature setting and the time value.

4. (original) The method of claim 3, wherein the first order rate relationship for the first energy process is a first Larson Miller relationship that relates application of thermal energy to the structure and the physical property, and wherein the first order rate relationship for the second energy process is a second Larson Miller relationship that relates application of oscillatory energy to the structure and the physical property.

5. (original) The method of claim 4, further comprising:

determining a first Larson Miller parameter according the first Larson Miller relationship, the first Larson Miller parameter corresponding to the desired physical property value;

determining a second Larson Miller parameter according to the second Larson Miller relationship, the second Larson Miller parameter corresponding to the desired physical property value;

selecting a first one of the temperature setting and the time value;

selecting a second one of the temperature setting and the time value according to the first and second Larson Miller parameters, according to the first Larson Miller relationship, and according to the first one of the temperature setting and the time value.

6. (original) The method of claim 5, further comprising determining a third Larson Miller parameter according to the first and second Larson Miller parameters, wherein the second one of the temperature setting and the time value is selected according to the third Larson Miller parameter, according to the first Larson Miller relationship, and according to the first one of the temperature setting and the time value.

7. (original) The method of claim 6, wherein determining the third Larson Miller parameter comprises subtracting the second Larson Miller parameter from the first Larson Miller parameter.

8. (original) The method of claim 7, wherein selecting the second one of the temperature setting and the time value comprises evaluating the first Larson Miller

relationship using the third Larson Miller parameter and the first one of the temperature setting and the time value to obtain the second one of the temperature setting and the time value.

9. (original) The method of claim 4, wherein the physical property is internal stress, and wherein the desired physical property value is one of a remaining internal stress value and an internal stress reduction value.

10. (original) The method of claim 1, wherein the physical property is internal stress, and wherein the desired physical property value is one of a remaining internal stress value and an internal stress reduction value.

11. (currently amended) The method of claim 1, wherein the first order rate relationship for the first energy process is a first Larson Miller relationship that relates application of the first energy type to the structure and the physical property, and wherein the first order rate relationship for the second energy process is a second Larson Miller relationship that relates application of the second energy type to the structure and the physical property.

12. (original) The method of claim 11, further comprising:
determining a first Larson Miller parameter according the first Larson Miller relationship, the first Larson Miller parameter corresponding to the desired physical property value;

determining a second Larson Miller parameter according to the second Larson Miller relationship, the second Larson Miller parameter corresponding to the desired physical property value;

selecting a first one of the operational setting and the time value;

selecting a second one of the operational setting and the time value according to the first and second Larson Miller parameters, according to the first Larson Miller relationship, and according to the first one of the operational setting and the time value.

13. (original) The method of claim 12, further comprising determining a third Larson Miller parameter by subtracting the second Larson Miller parameter from the first Larson Miller parameter, wherein the second one of the operational setting and

the time value is selected according to the third Larson Miller parameter, according to the first Larson Miller relationship, and according to the first one of the operational setting and the time value:

14. (original) The method of claim 13, wherein selecting the second one of the operational setting and the time value comprises evaluating the first Larson Miller relationship using the third Larson Miller parameter and the first one of the operational setting and the time value to obtain the second one of the operational setting and the time value.

15. (currently amended) The method of claim 1, wherein the second energy type is oscillatory, wherein the second energy type is provided to the structure at a frequency selected according to a resonant frequency of a system in which the structure is mounted while performing the first and second energy processes.

16. (currently amended) The method of claim 15, wherein the second energy type is provided to the structure at a frequency at or near the resonant frequency of the system.

17. (currently amended) The method of claim 1, wherein the second energy type is selected from the group consisting of sonic, laser, electrical, magnetic, mechanical vibration, and microwave.

18. (currently amended) A method of changing a physical property of a structure, comprising:

providing energy of a first energy type to a structure by performing a first energy process according to an operational setting; and

providing energy of a second energy type to the structure at an energy level above an activation energy for the structure by performing a second energy process;

wherein the first and second energy processes are performed concurrently to provide energy above an activation energy for the material of the structure for at least a time value; and

wherein one of the operational setting and the time value are selected according to a desired physical property value and according to a first order rate relationship that

relates concurrent application of the first and second energy types to the structure and a physical property of the structure.

19. (currently amended) The method of claim 18, further comprising determining the Larson Miller relationship that relates concurrent application of the first and second energy types to the structure and the physical property of the structure.

20. (currently amended) A method of stress relieving a structure, comprising:

determining a first Larson Miller relationship that relates application of thermal energy to the structure and internal stress in the structure;

determining a second Larson Miller relationship that relates application of oscillatory energy to the structure and the internal stress in the structure;

determining a first Larson Miller parameter according the first Larson Miller relationship and according to a desired internal stress value for the structure;

determining a second Larson Miller parameter according to the second Larson Miller relationship and according to the desired internal stress value;

determining a third Larson Miller parameter according to the first and second Larson Miller parameters by subtracting the second Larson Miller parameter from the first Larson Miller parameter;

selecting a first one of a temperature setting and a time value;

selecting a second one of the temperature setting and the time value according to the third Larson Miller parameter, according to the first Larson Miller relationship, and according to the first one of the temperature setting and the time value;

selecting one or more oscillatory operational settings ~~according to a resonant frequency of a system in which the structure is mounted;~~

providing thermal energy to the structure according the thermal operational settings; and

concurrently providing oscillatory energy to the structure according to the oscillatory operational settings for a time greater than or equal to the time value.

21. (previously presented) The method of claim 20, wherein selecting the second one of the temperature setting and the time value comprises solving a first Larson Miller equation for the second one of the temperature setting and the time value

using the first one of the temperature setting and the time value and the third Larson Miller parameter, wherein the first Larson Miller equation represents the first Larson Miller relationship.

22. (currently amended) A method of determining operational settings and time values for concurrent application of multiple energy ~~types~~forms to a structure to change a physical property of the structure, the method comprising:

determining a first parameter according to a desired physical property value for the structure and according to a first order rate relationship for a first energy process that relates application of a first energy ~~type~~ to the structure and the physical property;

determining a second parameter according the desired physical property value and according to a first order rate relationship for a second energy process that relates application of a second energy ~~type~~ to the structure and the physical property;

selecting a first one of a time value and an operational setting for the first energy process;

selecting a second one of the time value and the operational setting according to the first and second parameters, according to the first order rate relationship for the first energy process, and according to the first one of the time value and the operational setting.

23. (original) The method of claim 22, further comprising:
determining the first order rate relationship for the first energy process; and
determining the first order rate relationship for the second energy process.

24. (currently amended) The method of claim 22, wherein the first order rate relationship for the first energy process is a first Larson Miller relationship that relates application of the first energy ~~type~~ to the structure and the physical property, and wherein the first order rate relationship for the second energy process is a second Larson Miller relationship that relates application of the second energy ~~type~~ to the structure and the physical property.

25. (original) The method of claim 22, further comprising determining a third parameter according to the first and second, wherein the second one of the time value and the operational setting is selected according to the third parameter, according

to the first order rate relationship for the first energy process, and according to the first one of the time value and the operational setting.

26. (original) The method of claim 25, wherein determining the third parameter comprises subtracting the second parameter from the first parameter.

27. (original) The method of claim 25, wherein selecting the second one of the time value and the operational setting comprises evaluating the first order rate relationship for the first energy process using the third parameter and the first one of the time value and the operational setting to obtain the second one of the time value and the operational setting.

28. (original) The method of claim 22, wherein the physical property is internal stress, and wherein the desired physical property value is one of a remaining internal stress value and an internal stress reduction value.

29. (currently amended) A method of determining operational settings for concurrent application of multiple energy ~~types~~forms to a structure to change a physical property of a structure, the method comprising:

determining a first order rate parameter according to a first order rate relationship that relates concurrent application of first and second energy ~~types~~energies to the structure and a physical property of the structure, the first order rate parameter corresponding to a desired physical property value for the structure;

selecting a first one of an operational setting for the first energy process and a time value; and

selecting a second one of the operational setting and the time value according to the first order rate parameter, according to the first order rate relationship, and according to the first one of the operational setting and the time value.

30. (currently amended) The method of claim 29, further comprising determining the first order rate relationship that relates concurrent application of first and second energy ~~types~~energies to the structure and a physical property of the structure.

31. (cancelled)

32. (cancelled)

33. (previously presented) The method of claim 2, further comprising continuing the second energy process after discontinuing the first energy process until the structure temperature is less than a critical temperature.

34. (cancelled)

35. (new) A method for of stress relieving a structure, the method comprising: applying a first energy to a structure at a first energy level; and concurrently applying a second energy to the structure at a second energy level; wherein the first and second energies are different, wherein the energy applied to the structure is above an activation energy for the structure material, wherein the first and second energies are applied to the structure concurrently for a predetermined time value, and wherein at least two of the energy levels and the time value are selected to provide a desired amount of stress reduction in accelerated fashion.

36. (new) The method of claim 35, wherein the first energy is thermal and the second energy is vibration.

37. (new) The method of claim 35, wherein at least two of the time value and the energy levels are selected according to at least one first order rate relationship that relates application of at least one of the first and second forms of energy to the structure and according to the desired amount of stress reduction.

38. (New) The method of claim 35, wherein the first energy is thermal and wherein the second energy is time-varying.

39. (New) The method of claim 38, wherein the second energy is selected from the group consisting of sonic, laser, electrical, magnetic, mechanical, and microwave.